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MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY
UNITED STATES DEPARTMENT OF AGRICULTURE.

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Number 49.

May , 1918.

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GERMANY MUST BE BEATEN : PERSHING.

THERE IS NO QUESTION OF MODERATION, JUSTICE OR RIGHT, WHICH AT PRESENT CAN
 OBTAIN BETWEEN THE ENTENTE AND THE CENTRAL POWERS!

GERMANY MUST BE BEATEN!

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ANY ISSUE WHICH MAY COMPREHEND DISCUSSION IS AT ONCE VOID THROUGH THE LIM-
 TATIONS OF HUMAN UNDERSTANDING AND IS ANSWERED ONLY BY THE STUBBORN FACT -
 THAT GERMANY MUST BE BEATEN!

"CAVE CANEM*!

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THERE IS NO OVERT ACT OF DELIBERATE TREASON SO ABOMINABLE, SO REPREHENSIBLE, AS
 THE INSIDIOUS WORK OF ONE WHO WILFULLY SEEKS TO DEPRECIATE THE ENTHUSIASM OF THE
 PATRIOT!

LIEUTENANT VERNON KING.

With deep regret the attention of the personnel of the Bureau of Entomology
 is called to the death of Lieutenant Vernon King, formerly Scientific Assistant
 in the branch of Cereal and Forage Insect Investigations.

Lieut. King was at one time attached to the staff of the Wellington, Kans.,
 field laboratory and was afterwards placed in charge of the station at Charleston,
 Mo. He resigned from the service November 5, 1914, for the purpose of entering the
 British Army, and proceeded to Canada with this idea in view. For some reason he
 was not admitted to the Canadian troops and went to England where he gained an
 appointment in the service for sea duty. For some time he was stationed at the
 Dardanelles but more recently had become a member of the flying corps and the last
 direct news received from him stated that he was flying in the vicinity of Verdun.
 The press account of his death, which is in the form of a letter from his Command-
 ing Officer, Maj. C. F. A. Portal, addressed to Lieut. King's father, states that
 while serving as a flying observer on April 11, 5:20 p.m. his plane was attacked by
 three enemy scouts and shot down. Lieutenant King lived for about one-half hour
 but did not regain consciousness.

During Mr. King's term of service in the Bureau of Entomology he made many
 friends by reason of his genial personality and vivacious disposition.

The chief investigations conducted by him were those on the corn wireworm
Horistonotus uhleri which was afterwards completed by Mr. E. H. Gibson under
 the direction of Mr. W. R. Walton, Entomologist in Charge, Cereal and Forage Insect
 Investigations.

The following is a copy of the letter of Major Portal:

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No. 16 Eqn. R. A. F.

B. E. F.

April 12th.

Dear Mr. King:

I am extremely sorry to have to tell you that your son, Lt. V. King, was

killed in action in an air fight yesterday, April 11, at 5:20 p.m.

He was flying as an observer to Capt. Jones, the most experienced pilot in the Squadron and they were attacked and shot down by three enemy scouts. Your son put up a great fight, firing 250 rounds at the hostile machines, but they could not cope with odds of three to one for long, and were eventually shot down. Your son lived for about one-half hour, but never regained consciousness.

We are extremely sorry to lose him, as he was very popular with all ranks of the Squadron. Always keen and cheerful, he set a splendid example to everyone, and did much to keep up the high spirits which this unit has always shown.

We brought his body in last night and he will be buried by the side of his pilot and many other brave men from this Squadron at Aubigny, near here, on the road from Arras to St. Pol.

Please accept on behalf of the whole Squadron our deepest sympathy in your sad loss.

Yours very sincerely,

(signed) C. F. A. PORTAL (Major)
35 Whitehill Road,
Graves End.

IN MEMORIAM

Vernon King, entomologist, soldier and hero, has passed beyond our ken. His life was devoted to research for the wellbeing of mankind -- and his death is a tribute to the welfare of Humanity!

Perhaps he might have chosen a different way of embarking on his last and greatest adventure, but those who know will understand that he went just as he would have chosen to go, had it been a matter of choice!

Philip Sidney said "Greater love hath no man, than he give up his life for his friend"! And so Vernon King has given his life - the greatest possession-- for the cause of Humanity.

"XXX The valiant never taste death but once

XXX Seeing that Death - a necessary end--will come, when it will come"!

DOCTOR HOWARD VISITS SOUTHERN STATIONS.

The Chief of the Bureau visited the stations at Tallulah and Mound, Louisiana, during May, for the purpose of interviewing Mr. Coad and his corps of assistants. He was much impressed by the work which is being done at Tallulah and will endeavor to have the work at Mound carried on as competently as possible during Lieutenant Van Dine's absence in the Army. The Bureau of Fisheries has detailed a very competent man to look into the question of the practical handling of mosquito-eating fish. The Chief then visited New Orleans, where he talked with Messrs. Holloway, Barber, Hutchison and King. Doctor Hunter came to New Orleans from Houston for consultation. Mr. Hutchison finds that he is in a favorable place for his important work on the body-louse.

BUREAU VISITOR DURING MAY.

Mr. A. E. V. Richardson, of the Department of Agriculture at Victoria, Australia, visited the Bureau on May 20th. He is looking into the bureau organization of the U. S. Department of Agriculture and the general subject of agricultural organization and cooperation in the United States, with extreme care. The Federation of Australian States is investigating the desirability of bringing about a

federal agricultural service, and all of the problems connected with such an organization are under careful investigation. The different colonies in Australia have developed strong departments of agriculture with an entomological service in each one. The old problem of "States' Rights" is naturally more confusing out there with the new Federation than it is in the United States or even in South Africa. In the latter case there has been not simply a federation, but a much more centralized organization.

WAR LIBRARY SERVICE

The returns from the March drive of the American Library Association for books for the camp libraries have not yet been fully tabulated but as far as made indicate a most generous response on the part of our people. Since the drive more than a thousand volumes have been brought in to the Library of the Department of Agriculture alone. This is a splendid beginning but the camp libraries' needs are continuous and will be until the war ends. Therefore bring in as many more books as you can spare from your shelves for all can be used. Letters in the library journals from the men in charge of these libraries show how very much the books are appreciated by the soldiers and sailors.

INFORMATION RELATIVE TO INSECTS DESIRED.

The compiler of the Monthly Letter of the Bureau will greatly appreciate it if members of the Bureau force will furnish him with citations wherein insects have been used as the basis of fiction. Many such contributions to fiction have been published in the past, some good, but for the most part indifferent or wholly unworthy. The following features are desired: Title of article, author, and year of publication: If published in a magazine, give name, month, and year of magazine. (B. A. Reynolds.)

HESSIAN FLY AND PARASITE TRAP CAGES FOR FIELD USE.

Last year certain of our Hessian fly experiments necessitated the determination of emergence of Hessian flies and parasites from known areas and for this purpose light proof boxes, consisting of simple frames covered with roofing paper answered the purpose satisfactorily. To these it was proposed to attach a parasite trap such as has heretofore been used for similar purposes. A trap was designed as follows: The trap proper was a cylinder about $2\frac{1}{2}$ inches in diameter and 4 inches long and made of celluloid held in place by a framework of tin. The ends were covered with a fine cheesecloth. A hole was made in the side and a 20mm. glass tube inserted and the outer projecting edge of the tube inserted in the roofing paper cage. This answered very satisfactorily, but the cage was rather difficult to make and further the opening of the glass tube so large many of the flies and parasites probably returned to the darkened cage.

At the Hessian fly conference in Washington last winter Mr. Creel suggested a tin trap which consisted of a cylinder of tin in which was soldered a cone of tin with an opening at the tip of cone. This is inserted in the cage and a glass vial fitted into the cylinder of tin. This was a simple affair and seemed satisfactory except that the small opening permitted only a small ray of light to enter the darkened cage which seemed possibly insufficient to readily attract the insects into the trap. Accordingly we designed another simple trap which enables us to secure a

maximum ray of light. This consists of a glass vial 20 to 30 mm. in diameter, in the open end of which a cone of thin celluloid is fitted. The glass vial is then fitted into the opening in the cage. The three types of traps were sent to C. F. Turner who is conducting Hessian fly experiments at Nashville, Illinois. Mr. Turner tried them out and obtained Hessian fly in the traps as follows:

Celluloid cylinders with vial trap - Avg. 15 per trap.

Metal collar and cone with vial - Avg. 6 per trap.

Glass vial with celluloid cone trap- Avg. 24 per trap.

Similar results were obtained by us in the case of gnats issuing from light proof cages and all of the results indicate clearly that the glass vial with celluloid cone trap which offers a maximum amount of light and at the same time has but a small opening at the entrance gives far better results than the metal traps which permit only a small ray of light entering the cage. It might also be stated that the celluloid cone trap is the simplest and most inexpensive of the three types tested. For some purposes a glass tube open at both ends will prove more convenient than the glass vials, the outer end to be closed with fine cheesecloth or a cork stopper. (John J. Davis.)

LIBRARY.

Miss Mabel Colcord, Librarian.

NEW BOOKS.

- Ball, S. C. Migration of insects to Rebecca Shoal light station and the Tortugas Islands, with specific reference to mosquitoes and flies. Extracted from Publication No. 252 of the Carnegie Institution of Washington, 1918, p. 193-212.
- Barrows, A. L. An unusual extention of the distribution of the shipworm in San Francisco Bay, California. Berkeley, 1917. p. 27-43 (Univ. of California publications in zoology v. 18, no. 2)
- Barton, W. H. and Stewart, W. P. Boll weevil as farm manager. Clemson College, So. Carolina. Exten. Div. in cooperation with the U. S. Dept. Agr. Farmers' reading course Bul. 27. 32p.
- Belgium-Ministere des colonies-Service de l'Agriculture. Etudes de biologie agricole. No. 3. Mayne, R. Insectes et autres animaux attaquant le cacaoyer au Congo Belge. London, 1917. 80p.illus., 5 pl.
- British museum (Natural history) Economic series no. 4-7. London, 1916-1917.
- No. 4 Edwards, F. W. Mosquitoes and their relation to disease. 19p. 1916
- No. 5 Cummings, B. F. The bed-bug. 20p. 1917
- No. 6 Hurst, Stanley Species of Arachnida and Myriopoda)Scorpions, spiders, mites, ticks and centipedes) injurious to man. 60p. 1917
- No. 7 Kirkpatrick, H. The biology of waterworks. 58p. 1917.

- Colonial sugar refining company. Agricultural report No. 3. Sydney, Dec. .1917.
The cane beetle borer in Australia, by Robert Veitch. 15p.
Committee on the suppression of the pine blister rust in North America. Jan. 1918.
White pine blister rust, comp. by Harris A. Reynolds. 40p.
Dutt, H. L. The greasy surface caterpillar: its life history and seasonal history
in Agr. Jour. Dept. Agr. Bihar and Orissa v.5, No. 1, p. 1-14, 1917.
Rosenau, M. J. Preventive medicine and hygiene. ed. 3. New York and London, 1917.
1374p.
Storey, G. List of Egyptian insects in the collection of the Ministry of agri-
culture, Cairo, 1916. 52p. (Egypt. Dept. Agr. Tech. and sci. service
Bul. 5. Ent. Section)
Wellcome tropical research laboratory.- Gordon memorial college, Khartoum.
Entomological bulletin 4-7. Khartoum, 1917.
No. 4 Pink boll worm. 1917
No. 5 Pink boll worm control. 1917
No. 6 Sudan cotton bollworm. 1917
No. 7 The weed Hanbuck (Abutilon spp.) and its relation to the
cotton growing industry in the Anglo-Egyptian Sudan. 1917

BEE CULTURE

E. F. Phillips, Apiculturist in Charge.

G. H. Cale left on May 1 for Wisconsin where he will conduct extension work
in beekeeping in cooperation with the Extension Division of that State.

D. A. Davis of Ames, Iowa, has accepted appointment and will spend the
month of May in extension work in the state of Iowa.

W. H. Foster closed his work in Oregon on April 15 and proceeded to Montana
for one month.

Geo. S. Demuth returned recently from an extended trip through California,
where he and E. F. Atwater conducted a special series of meetings dealing especial-
ly with the control of European foulbrood.

C. E. Bartholomew resigned, effective April 21.

G. C. Matthews recently resigned to return to commercial beekeeping in Idaho.

E. W. Atkins left his work in Nebraska on April 15 and proceeded to Kansas,
where he will remain for one month.

E. G. Baldwin has recently accepted appointment and has been assigned to
extension work in Indiana. On May 1 he left for Michigan where he will spend the
entire month in a series of meetings being arranged in that State.

Geo. H. Rea left New York at the termination of his appointment on April 15.
Arrangements have, however, been made for his reappointment effective May 15, at
which time he will return for work in New York.

C. F. Stiles was recently in Washington for a conference, after which he
returned to his work in Oklahoma.

E. F. Phillips left early in May for a trip through Missouri, Illinois,
Indiana, Ohio, New York and New Hampshire. Some meetings of beekeepers are being
arranged in Missouri in connection with this trip.

DECIDUOUS FRUIT INSECT INVESTIGATIONS.

A. L. Quaintance, Entomologist in Charge.

Wm. A. Hoffman, a graduate of Cornell University, has been appointed
Scientific Assistant and will assist Dr. N. E. McIndoo in investigations of the
insecticidal constituents of plants, and other insecticidal questions.

Figure 1 consists of three panels, A, B, and C, illustrating the experimental design. Panel A shows a timeline from 0 to 10 minutes. At 0 minutes, there is a 'Rest' period. At 5 minutes, there is a '5 min rest' period. At 10 minutes, there is a '5 min rest' period. Panel B shows a timeline from 0 to 10 minutes. At 0 minutes, there is a 'Rest' period. At 5 minutes, there is a '5 min rest' period. At 10 minutes, there is a '5 min rest' period. Panel C shows a timeline from 0 to 10 minutes. At 0 minutes, there is a 'Rest' period. At 5 minutes, there is a '5 min rest' period. At 10 minutes, there is a '5 min rest' period.

Leo C. Antles, a graduate of the Colorado Agricultural College, has been appointed Scientific Assistant, and in cooperation with the Colorado Agricultural Experiment Station will be engaged in experimental work in the control of the codling moth in the Grand Valley, Colo., with headquarters at Grand Junction, Colo.

The following men have been appointed for scouting work for the oriental peach moth: E. D. Brown, William M. Robinson, R. P. Allaman, J. H. Smith, V. A. Roberts, E. T. Rannells, H. B. Peirson, H. S. Saidel, C. H. Alden, J. H. Boyd, and A. F. Vierheller.

H. K. Plank, in charge of the cooperative cranberry insect work at Seaview, Wash. is now in Grand Junction, Colo. inaugurating experiments in codling-moth control in orchards. He will shortly return to his headquarters at Seaview and the work at Grand Junction will be continued by Mr. Antles.

SOUTHERN FIELD CROP INSECT INVESTIGATIONS.

W. D. Hunter, Entomologist in Charge.

Dr. Oscar H. Basseches graduated April 17 from the United States College of Veterinary Medicine with the degree of "Doctor of Veterinary Medicine." He has been appointed in the Bureau as a Scientific Indexer.

J. L. Webb left Washington during the month to spend several weeks at Dallas, Texas, before returning to his field station at Topaz, Calif.

C. P. Trotter, who was engaged temporarily on the malaria mosquito work at Mound, La., resigned April 15 to enter the Naval Hospital Service.

E. A. McGregor returned to his field station at El Centro, California, on April 1 after spending a few weeks in Washington. On his return trip he stopped at Houston, Texas, for a conference with Doctor Hunter.

FEDERAL HORTICULTURAL BOARD.

C. L. Marlatt, Chairman.

Pink Bollworm Field Work.

The destruction and clean-up of cotton in and surrounding the districts in Texas invaded by the pink bollworm is now practically completed for the crop of 1917. The following summary of this work is condensed from a report prepared by Mr. F. S. Puckett for Dr. Hunter:

A total of 8794 acres of cotton land has been cleaned of standing and scattered cotton at an average cost of \$9.94 per acre.

The cotton fields cleaned represent 657 owners or tenants or an average of 13.38 acres to each owner or tenant. Most of the fields consisted of from one to one-half dozen acres and only in a few instances did the fields approach or exceed one hundred acres.

In addition to the clean-up of these cotton fields within and surrounding the known infested areas, all the gins in this section, some twenty in number, have also been subjected to a thorough cleaning, with destruction of remaining and scattered seeds.

An effort has also been made which has been substantially successful to collect and mill under supervision all cotton seed grown in this section, and the lint cotton has been shipped to foreign countries via Galveston. These several steps have eliminated so far as is now possible the chance of overwintering and reinfestation of the new crop by the pink bollworm hibernating in the cotton fields or in cotton seed or in lint cotton of the crop of 1917.

Under the recently enacted Texas law proclamations have been issued by the Governor of Texas quarantining the known infested districts in Texas, namely, the Hearne district and the large district surrounding Trinity Bay and including Beaumont. Supplementing this action these same districts have been established by proclamation of the Governor as cotton-free areas. Within these areas the growing of cotton is designated a public menace and is prohibited "for a term of three years or so long as such condition of menace to the cotton industry shall be deemed to exist." A border cotton-free zone has also been established by proclamation of the Governor to include the counties of Kinney, Maverick and Valverde, as a result of the determination of infestation of cotton lands in Mexico within twenty-five miles of the Texas-Mexican border, opposite Eagle Pass and Del Rio. In these counties the growth of cotton is similarly prohibited for a period of three years.

The pink bollworm force now includes twenty-eight inspectors in the Texas work under the direction of Dr. W. D. Hunter; eleven in the border control and quarantine service under the direction of Mr. R. Kent Beattie, and three in the investigative and research work in Mexico under the direction of Mr. August Busck in cooperation with the Bureau of Entomology.

Nursery Stock Hearing.

A notice of public hearing on proposed restrictions or prohibitions with respect to the importation of plants and seeds from foreign countries was issued March 28, 1918. This hearing was called for May 28 and had in view particularly the question of prohibiting or restricting the further entry of plants imported with earth about the roots and plants from little-known and little-explored countries of the world, and as to which there is almost a complete dearth of information concerning insect pests and plant diseases.

Moth Hearing.

The annual hearing for the purpose of including in the moth quarantine the additional area infested during the year by the gipsy moth and the brown-tail moth in the New England States was held May 2, 1918. The gipsy moth has spread considerably. It will not be necessary to extend the quarantine on account of the brown-tail moth.

Messrs. Sasscer, Sanford, and Kauffman, inspectors of the Board, spent some time in Florida inspecting and certifying for shipment plants in the Introduction Gardens of the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry at Miami and Brooksville.

FOREST ENTOMOLOGY.

A. D. Hopkins, Forest Entomologist.

F. C. Craighead spent three days (March 18, 19, 20) in the vicinity of Philadelphia examining the black locust plantations of the Pennsylvania Railroad to locate a suitable tract for experimental spraying.

These locust plantations were set out during 1902-10 and have been almost totally destroyed by the "locust borer" (*Cylenia robiniae*). A portion of one tract will be sprayed this year and several following years to determine if the cost of controlling these insects will permit the growing of these trees as a commercial proposition.

W. S. Fisher will be stationed for about three months at Lyme, Conn., and engaged in investigations of forest and shade-tree insects in general and in laboratory and rearing work relating to these insects.

STORED PRODUCT INSECT INVESTIGATIONS
E. A. Back, Entomologist in Charge.

At the request of the Federal Public Health Service, Dr. Back spent Easter Sunday in New York investigating the condition of the storage space recently taken over at the Bush Terminals by the Quartermaster's Department of the National Army. It had been determined to fumigate these warehouses but the Easter inspection showed that fumigation was neither necessary nor desirable at that time. It is estimated that the day's work saved the Government at least \$10,000.00 for chemicals alone.

Again, during the latter part of April, Dr. Back visited New York for the purpose of consulting with Col. H. S. Cole, Storage Officer of the Port of New York, regarding infestations of Federal stored products at the Bush Terminals. As a result of this trip, and the cooperation between Dr. Howard and Col. F. B. Wells, Q. M. Corps, N. A., Director of Storage and Traffic of the War Department, Col. Wells has given his approval to the establishment, by this Bureau, of some system of inspection of all Federal stores in New York City intended for shipment over-seas. Dr. Back will soon work out the details of this cooperation between the Quartermaster's Department and the Bureau of Entomology with Col. Cole in New York. It is hoped that this service rendered the Quartermaster's Department by the Department of Agriculture will prove of value in preventing, in a large measure, much of the excessive losses that have been and are still taking place in Army supplies.

Early in April, Dr. Back and E. R. Sasscer of the Federal Horticultural Board visited Brooksville, Florida for the purpose of looking into an outbreak of the broad-nosed grain weevil, Caulophilus latinasus. In addition to previous records of the occurrence of this little-known weevil, quite a few new points of distribution have been determined so that it now appears that this pest is so well distributed throughout Florida, at least, that there is no need of special quarantine measures against it.

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The outbreak of Dermestes vulpinus in a fertilizer factory at Norfolk, Va. that was investigated last fall has continued to receive the attention of this office. A. B. Duckett has made several trips to Norfolk to secure data on the prevalence of this pest and has secured some very interesting results.

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F. B. Milliken has changed his headquarters from New Orleans to Amarillo, Tex. During the past two months, Mr. Milliken has been devoting his entire attention to a study of insect conditions in warehouses, flour mills and granaries at various points in Texas. One of the interesting phases of his work has been an inspection, from an insect standpoint, of the food supplies at several of the Army camps in Texas.

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R. L. Clute, whose headquarters are at Gainesville, Fla., has been traveling about the state of Florida gathering information regarding the actual status of corn stored under varying conditions. It is interesting to note that where progressive farmers have properly housed their corn and have fumigated it,

weevils are very scarce. Corn, however, in untreated bins is already practically ruined, both for seed and for food. The warm moist climate of Florida especially favors the increase of all kinds of so-called weevils.

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TROPICAL AND SUBTROPICAL FRUIT INSECT INVESTIGATIONS

C. L. Marlatt, Entomologist in Charge.

E. H. Dusham was given a commission as Scientific Assistant, effective April 1, 1918. It was intended to have Mr. Dusham conduct an investigation of fruit flies in the Canal Zone. This investigation has been abandoned for the present, and steps are now being taken to have Mr. Dusham transferred to the Federal Horticultural Board to assist in the plant inspection work in Washington. Mr. Dusham graduated from Dartmouth College in 1910, and took his Master's degree at the Pennsylvania State College in 1915. Prior to going to the Pennsylvania State College Mr. Dusham spent two years at the Iowa State College of Agriculture as Assistant in Entomology. He attended Cornell University in 1916, taking up work leading to a doctor's degree.

Mr. Eugene L. Prizer was appointed to the position of Special Field Agent, effective April 16, 1918, for inspection work on citrus insects in California, Arizona, and adjacent States. Mr. Prizer has had three years' training at the University of California and three years' experience in practical field work with citrus pests.

TRUCK CROP INSECT INVESTIGATIONS

F. H. Chittenden, Entomologist in Charge.

Sweet-Potato Weevil Investigations.

In accordance with instructions from the Secretary of Agriculture a force of experts has been organized for the investigation of the sweet-potato weevil (Cylas formicarius), looking toward its control and, if possible, its ultimate eradication.

The following is the personnel at the present writing:

J. E. Graf, Entomologist in Charge of Field Work.

FLORIDA:

O. K. Courtney, in charge, assisted by B. L. Boyden, Scientific Assistant, Special Field Agents Frazier Rogers and K. E. Bragdon, and Assistant Entomological Inspectors, W. H. Merrill, M. B. Boyd, O. D. Link, H. E. Loomis, A. B. Jarrell, J. W. Hendry, and A. E. Booth.

The work in Florida is in special cooperation with Prof. Wilmon Newell, and all of the State inspectors and entomological officials.

ALABAMA:

K. L. Cockerham, in charge, assisted by inspectors R. A. Epperson, S. C. Brummit, and H. L. Weatherby.

In cooperation with Dr. W. E. Hinds and Dr. O. F. E. Winberg.

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Figure 1. The proposed model for the development of the *Staphylococcus aureus* infection in the skin of the patient with the skin disease. The model shows the interaction between the skin disease, the immune system, and the *Staphylococcus aureus* bacteria. The skin disease leads to a weakened immune system, which in turn leads to a higher risk of infection. The *Staphylococcus aureus* bacteria can enter the skin through a wound or a break in the skin, leading to an infection. The infection can then spread to other parts of the body, leading to a systemic infection.

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MISSISSIPPI:

K. L. Cockerham, in charge, assisted by inspectors F. B. Stephens, M. H. Arnold, L. M. Pritchard, F. T. Griffith, E. E. O'Neal, and F. A. Wright.
In cooperation with Prof. R. W. Harned, State Entomologist.

LOUISIANA:

T. H. Jones, in charge, assisted by Chas. E. Smith, Scientific Assistant, T. H. Cutrer, Special Field Agent, and inspectors Montfort Hall, C. F. Moreland, J. P. Landry, M. J. Kerr, W. T. Dillard, and J. H. Moreland.
In cooperation with Prof. W. R. Perkins and Dr. W. R. Dodson.

TEXAS:

M. M. High, in charge, assisted by F. A. Johnston, Entomological Assistant, Special Field Agents Oscar Barber, C. E. Trimble, J. N. Lowe, and inspectors C. H. Arndt, J. M. Reilly, D. R. Royder, and J. B. Rountree.
In cooperation with Prof. F. B. Paddock, Mr. W. B. Lanham, and Mr. Ed. L. Ayers.

GEORGIA:

O. K. Courtney, in charge, assisted by Paul Starkweather, inspector.

EXTENSION ENTOMOLOGY.

J. A. Hyslop, Entomologist in Extension work.

Since the last report from this office appearing in the News Letter, many changes in and additions to the personnel have taken place.

E. G. Baldwin has been reappointed for apiculture work in Indiana, Ohio, and Michigan.

T. C. Barber, in charge of the Sugar Insect Investigations laboratory at New Orleans, has been temporarily transferred to extension work on the control of sugar cane pests.

Charles Batchelder has been appointed as Special Field Agent on the control of truck crop insects, and has been assigned to Maine.

B. L. Boyden, formerly assisting in extension work on the control of truck crop insects in California, has been transferred to the sweet potato weevil work in the Gulf region.

G. H. Cale, of the Apiculture Research Office of the Bureau, has been assigned to Wisconsin for apiculture extension work.

F. R. Cole, of the Cereal and Forage Insect Investigations laboratory at Forest Grove, Oregon, has been assigned to part time on extension work in the Northwest.

O. K. Courtney, formerly doing extension work on truck crop insect control in Florida, has been transferred to the sweet-potato weevil work in that state.

D. A. Davis has been appointed Special Field Agent in apiculture extension work and has been assigned to Iowa.

Perry W. Fattig has been appointed Special Field Agent in extension work on the control of cereal and forage insects, and has been assigned to North Dakota.

C. K. Fisher has been appointed Special Field Agent in the same line of work, and has been assigned to Colorado.

A. L. Ford has been transferred from the Wellington, Kansas, Cereal and Forage Insects Research laboratory to extension work on the control of cereal and forage pests in Kansas, to take the place of Scott Johnson, who has resigned to enter the Navy.

S. W. Frost, Special Field Agent in Truck Crop Insects control in New York State, has resigned to accept a position with the Pennsylvania State College.

H. N. Gellert, who has been doing extension work in the control of truck crop pests in Florida, has resigned.

L. G. Gentner has been appointed Special Field Agent in the control of truck crop insects, and has been assigned to Wisconsin.

L. C. Griffith has been transferred from extension work on the control of deciduous fruit insects to general entomological extension work in New York State.

J. G. Griffith has been appointed Special Field Agent for extension work in the control of cereal and forage crop insects, and has been assigned to New Mexico.

Marshall Hertig has been appointed Special Field Agent to carry on extension work in the control of insects affecting cereal and forage crops, and has been assigned to Minnesota.

M. M. High, formerly doing extension work in truck crop insect control in Texas, has been transferred to the sweet-potato weevil work.

A. H. Hollinger has been appointed Special Field Agent and assigned to Texas, where he will do extension work on the control of cereal and forage insects.

G. J. Hucker has been appointed Special Field Agent in the control of cereal and forage insects, and has been assigned to work in Nebraska.

H. E. Jaques has been appointed Special Field Agent in the control of cereal and forage insects, and has been assigned to Iowa.

Clay Lyle has been appointed Special Field Agent in the control of truck crop insects, and assigned to work in Mississippi, to take the place of Mr. Kirby Cockerham, who has been transferred to the sweet potato weevil work.

E. G. Kelly, formerly in charge of the Bureau of Entomology laboratory at Wellington, Kansas, has accepted appointment as Extension Entomologist in Kansas.

D. C. Parman, who has been carrying on a campaign in the control of insects affecting domestic animals in Texas, is now carrying on a similar campaign in Louisiana.

E. L. Prizer has been appointed Special Field Agent in the control of insects affecting citrus fruits, and has been assigned to California.

Frank J. Rimoldi, formerly doing extension work in Connecticut on the control of deciduous fruit insects, has been transferred to Rhode Island, where he is doing general extension work in entomology.

A. D. Tilton has been appointed Special Field Agent in the control of deciduous fruit insects, and assigned to Massachusetts.

CEREAL AND FORAGE INSECT INVESTIGATIONS.

W. R. Walton, Entomologist in Charge.

H. R. Painter has been appointed Scientific Assistant and detailed to assist A. F. Satterthwait at Charleston, Mo. station. Mr. Painter until recently was assistant state entomologist for Oklahoma.

Roger Smith has been appointed Scientific Assistant and detailed to assist W. J. Phillips at the Charlottesville, Va. field laboratory. He will have charge of the investigations of the corn ear worm in relation to field corn. Mr. Smith reported for duty April 16.

A. C. Burrill, recently state entomologist for Idaho, has been appointed Special Field Agent and detailed for extension work in the State of Washington.

P. W. Fattig has been appointed Special Field Agent and detailed for duty in North Dakota effective April 5. Mr. Fattig will pay special attention to grasshopper control within his territory.

Marshall Hertig has been appointed Special Field Agent and detailed for duty at St. Paul, Minn., effective April 15.

P. B. Miles, for several years assistant in the alfalfa weevil investigations at Salt Lake City, has recently resigned from the service and will take up work in Idaho.

J. S. Stanford has been appointed as successor to Mr. Miles effective April 3.

A. H. Hollinger, formerly assistant to Dr. Leonard Haseman at Columbia, Mo., has been appointed Special Field Agent and detailed for duty at College Station, Tex., effective April 5. Mr. Hollinger will pay special attention to the chinch bug situation which has been regarded as serious in northern and central Texas.

G. J. Hucker has been appointed Special Field Agent and detailed for duty at Lincoln, Nebr., effective April 12.

W. R. Walton has returned to Washington after an inspection of the southern and southwestern field stations.

NOTES FROM CEREAL AND FORAGE INSECT LABORATORIES.

Mr. C. N. Ainslie, in charge of the Iowa field laboratory, reports under date of May 8 that *Lachnosterna* adults are more numerous this spring than for a number of years. They were at that date emerging in great numbers and were beginning to defoliate trees just as these were coming into leaf. Many of the larvae of all sizes are being found in newly plowed land. He also reports *Feltia gladiaria* and *Feltia jaculifera* present in large numbers in his locality. Mr. Ainslie reports under date of May 18 that he has found considerable numbers of different species of grasshoppers in several counties of South Dakota. The greater number of these are very young, though he collected several full-grown specimens in native grass pastures. He adds: "The hopper eggs seem to have wintered through in perfect condition, and are present by the million. In some localities we found it impossible to discover the oviposition grounds, but as a rule the sod along the fence rows and roadsides and in the firm soil of pastures were the favorite places. Very few seem to be placed in or near the alfalfa crowns, and alfalfa fields in good condition have few or no eggs. In one field near Platte where there were small areas without alfalfa, there was an appalling number of eggs. One small spot, perhaps four feet square, kept us busy for nearly an hour. The ground was covered with tufts of dead grass, and beneath the roots of this grass there was almost a solid mass of eggs. The well-shaped pods of eggs that I took last fall appear to break down during the winter, and the loose eggs shell out like rice grains when the soil is disturbed. We gathered nearly a pint of nearly clear eggs from this one spot, and there were probably other places as bad."

Mr. R. M. Farrow, Piedro, Colo., under date of May 6, reports to the Bureau that grasshoppers are hatching out in greatest abundance in his local-

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ity and indicates that they are present in larger numbers than at any time last year.

Mr. D. J. Caffrey, in charge of the Maryland field station, reports under date of May 4, considerable injury to red clover by the clover leaf weevil, *Phytonomus punctatus*. The infestation is especially severe on the farm of Mr. W. D. Myers, at Smithburg, Md. The larvae were feeding voraciously on leaves and on the tender developing crowns and were also found in large numbers hiding under debris and mulch on the ground surface. Adults were also present.

Mr. W. B. Turner, Acting in Charge of the Maryland field laboratory, under date of May 8 reports that adult *Lachnosterna* had already issued in large numbers. The predominating species were *Lachnosterna fusca* and *Lachnosterna arcuata*.

Mr. A. F. Satterthwait, in charge of the Missouri field station, under date of April 30 states that *Harmolita* adults were issuing freely on that date under normal conditions from prostrate wheat stubble on unplowed ground and from stubble left on the surface of plowed ground. Mr. Satterthwait also reports, under date of May 9, a heavy *Harmolita* infestation in the general vicinity of Mountain Grove, Mo.

Mr. R. A. Vickery, in charge of the Texas field station, reports, under date of May 1 that *Lachnosterna* adults are doing extensive damage in the vicinity of San Antonio to gardens and to cotton. He also reports *Laphygma* destroying forage crops in Hidalgo county near Brownsville, Texas. Reports from this, as well as several other portions of the country, indicated that wheat bran will be very difficult and expensive to obtain this season in connection with poisoning control measures. Mr. Vickery also reports, under date of May 10, that *Lachnosterna cribosa* has destroyed considerable acreage of cotton, and has wrought injury to gardens near San Antonio. He has found it possible to control this species with poison bran mash. Mr. T. S. Wilson of the Texas station, while investigating the insect conditions in Hidalgo county during the first week in May, found larvae of *Heliothus obsoleta* very numerous feeding on young corn plants, cotton, alfalfa, bean pods, leaves of young orange trees, and other plants in accordance with their well-known omnivorous habits. Many eggs were found on corn silks and some larvae in corn ears at Brownsville, Texas. He also found larvae of *Laphygma frugiperda* doing considerable damage to corn near Edinburgh, Texas. *Loxostege similalis* had also wrought much injury to young cotton in a few fields where *Ananthurus* was permitted to grow. It is noteworthy that fields uninfested with weeds were damaged little if any. A few larvae were found on the young corn also. During the first week in May there were comparatively few larvae, but adults were present in large numbers, indicating that the generation was at that time principally in the adult stage.

Mr. A. H. Beyer, of the South Carolina field station, under date of May 20, advises a high percentage of injury by *Diabrotica* this year in western Florida and South Georgia. *Prodenia ornithogalli* larvae are seriously defoliating corn over an area extending from South Carolina into Florida. *Diatraea saccharalis* was also found by him in considerable numbers in the early plantings in Florida.

Mr. C. W. Creel, in charge of the Oregon station, under date of May 3, reports as follows: "The Hessian fly is apparently present in all spring wheat fields as far south as Harrisburg, Oregon, the infestation varying from 1% to 20% in fields examined. At the present time the principal insect injury to cereal and forage crops in the Willamette Valley is being caused by *Macrosiphum pisi*, this aphid causing great damage to vetch and apparently has

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a big start over its native enemies and threatens to ruin the vetch crop in a number of localities. Syrphids are holding it in check in some places, as is also the fungus *Empusa aphidus* Hoff."

Mr. Creel also has under way an extensive educational campaign in cooperation with the extension department of the Oregon Agricultural College for control of the clover flower midge in the Pacific Northwest. There is apparently considerable reduction in the red clover acreage this season, as compared with last, due probably to summer killing of young clover plants last season. It is hoped that this campaign may tend to offset this reduction in acreage by persuading the farmers who have hitherto raised both crops for hay to leave their last crop for seed.

Mr. John J. Davis, in charge of the Indiana field laboratory, under date of May 20 reports as follows: "No unusual developments have occurred during the past month. At present there is every indication that cutworms will be abundant as they are to be found commonly behind the plow in northern Illinois, southern Wisconsin and eastern Iowa. A few reports of cutworm injury in gardens have been reported. At this date corn is being planted in the areas mentioned above and none has sprouted above ground.

Mr. Ricker reports finding grasshopper eggs behind the plow in abundance sufficient to indicate a prevalence of these insects this season.

As has been previously stated we find grubs less abundant than three years ago but they occur in injurious numbers in many sections of the white grub area. In some localities they are undoubtedly less abundant than in the fall of 1917. This may be due to several reasons - A year ago the beetles did not appear until late, resulting in a larger number of very small and immature grubs to pass the winter and these grubs with less vitality and strength no doubt succumbed to diseases and the cold more easily than in a normal season and especially is it probable that the sudden freeze last October before the grubs had reached their deep winter quarters was detrimental to them. It is not likely that the cold weather during the past winter would have been any more destructive to grubs than in normal years had there not been the contributing factors mentioned above. The less general abundance of grubs this year in comparison to three years ago is partly due to the fact that the May beetles did not appear until late last season and the continued cool weather prevented them from ovipositing freely. Similarly it appears that the cool weather prevented the beetles from migrating as great distances from their hosts (trees) as in former years. The majority of grubs did not come near the surface until the past six or seven days because the soil has been cold up to this time and as a result farmers have not noticed grubs and many will plant corn on sod ground believing the grubs are not present when as a matter of fact many of these fields are infested but the grubs were below the plow line when the ground was plowed.

The effect of the cold winter was illustrated in an interesting way in the case of the joint-worm. At Shelbyville, Indiana, practically the center of the 1917 joint-worm area in Indiana, we found practically all larvae killed in the upstanding stubble, but in the stubble lying on or near the ground and most of that lightly covered with soil as a result of fall plowing, many live larvae were found and here there appeared to be only the usual mortality. Stubble lying on the ground was protected by snow during the period of coldest weather.

The season this year has been late but warm weather the past week has greatly improved conditions and we may expect insect problems to become evident within the next week or two."

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CONTRIBUTIONS ARE SOLICITED.

Funds are needed for knitting, surgical dressings, garment making, housing, entertainment, books, scrap books for hospitals, and war orphans, CONTRIBUTIONS ARE DESIRED FROM ALL EMPLOYEES OF THE BUREAU, BOTH IN WASHINGTON AND IN THE FIELD. ALSO FROM THEIR FAMILIES AND FROM ANYONE INTERESTED IN THE WORK.

Send your contributions to Mrs. H. S. Bishop, Bureau of Entomology, and specify, if you have any preference, to what purpose you desire the contribution to be put. NO AMOUNT IS TOO SMALL!

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